Housing Policy Impacts on Poverty and Inequality in Europe

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Motivation

- ▶ Housing is a primary good
- ▶ Poor housing conditions are detrimental to the health, schooling, and social interactions of household members
- ▶ Easy to support the idea that housing should be subsidized more than other consumption goods
- ▶ Two main housing public policies:
  - ▶ cash housing benefits (housing allowances)
  - ▶ in-kind housing benefits (social housing)

This paper examines the effectiveness of these two housing policies in reducing inequality and poverty in households' housing expenditures

This study

- ▶ Detailed comparison of housing inequality and poverty rates in 27 European countries

- ▶ We develop counterfactual distributions of incomes and housing services if housing policies were not implemented

- ▶ Estimate and disentangle the effect of the two main housing policies aimed at reducing inequality and poverty, for all types of tenure status

- ▶ We compare households' housing expenses and non-housing consumption expenditures

- ▶ Main findings:
  - ▶ cash housing benefits are more cost-effective than in-kind housing benefits (social housing), and more effective in reducing poverty than inequality.

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Related literature

- Housing allowances and social housing could have serious negative effects:

- pass-through of the cash housing benefits in rents
  - landlords capture a sizable share of housing benefits by raising rents (from around 16% in the US, to 50% in the UK, and 78% in France)
  - FR (Fack 2006; Grislain-Letrémy and Trevien 2022), UK (Gibbons and Manning 2006; Brewer et al. 2019), US (Susin 2002; Eriksen and Ross 2015; Collinson and Ganong 2018); FI (Kangasharju 2010; Viren 2013; Eerola and Lyytikäinen 2021; Eerola et al. 2022)

- social housing participate in urban segregation, are not cost-effective, and detrimental to tenants' mobility
  - FR (Gobillon 2001; Jacquot 2007; Verdugo 2016; Schmutz and Verdugo 2023), US (Olsen and Barton 1983)

Related literature

- Country-specific studies that investigate the effect of these two housing policies show that:
- the inclusion of imputed rent for social renters impacts income distribution and reduces inequality and poverty
  - US (Olsen 2001); UK (Gibbs and Kemp 1993); BE (Heylen 2013); FR (Trevien 2014)
- cash housing benefits have a significant reducing effect on inequality and poverty
  - Figari et al. (2019); Verbist and Grabka (2017)

Related literature

▶ This study departs from previous literature by:

1. disentangling the effects of cash housing benefits from the effects of in-kind housing benefits (social housing)

2. estimating and comparing the total impact of housing policies for all types of tenure status and all the European countries

3. providing a first account of the redistribution impact of the partial capture of cash housing benefits by landlords

4. comparing households' housing services and expenses to non-housing consumption expenditures

Data

- ▶ EU-SILC
  - ▶ Data on households' income, labor, housing and living conditions
  - ▶ Contains the imputed rents
  - ▶ Year 2017

- ▶ HBS
  - ▶ Data on households consumption expenditure
  - ▶ Year 2015

- ▶ Harmonized data for each country of the European Union

- ▶ We perform a statistical matching between EU-SILC and HBS databases (PMM method)

Methodology

The housing policies (HP) could be decomposed in two parts:

$$HP = \underbrace{\text{Housing allowances}}_{Cash\ housing\ benefit} + \underbrace{(\text{Imputed rent - Rent})}_{In-kind\ housing\ benefit}$$

▶ We compute:
1. cash advantages of each housing policy
2. housing services (what the households would have to pay without any public intervention nor any advantages from being owner-occupiers)
3. housing expenses (the actual amount paid by the households taking into account housing policies)

Methodology

- ▶ Then, we compare the counterfactual distributions to a natural benchmark
  - ▶ the disposable income without any housing public policies

- ▶ **Inequality measures:** Gini coefficients and Lorenz curves

- ▶ **Poverty measures:** Foster–Greer–Thorbecke indices
  - ▶ Poverty line sets at 60% of the national median equivalized disposable income
  - ▶ $FGT_0 =$ headcount ratio (i.e. proportion of households below the poverty line)
  - ▶ $FGT_1 =$ poverty gap index (i.e. intensity of poverty)
  - ▶ $FGT_2 =$ severity of poverty

Methodology
Gain from housing policies

Table 1: Cash advantages from housing policies by tenure status

Variable	$HP_{cash+in\text{-}kind}$	HP_{cash}	$HP_{in\text{-}kind}$
Tenure status	**Housing policies including cash housing benefits and reduced-rent**	**Housing policies with only cash housing benefits**	**Housing policies with only reduced-rent**
Owners	HB	HB	/
Market-rent tenants	HB	HB	/
Reduced-rent tenants	(IR - R) + HB	HB	IR - R
Free-rent tenants	/	/	/

Notes: HP = housing policies, IR = imputed rent, R = rent, HB = cash housing benefits.

Sources: authors' chart.

Methodology
Housing services and expenses measurement

Table 2: Housing expenditure by tenure status

Variable	R	IR	HS	HE	NG
Tenure status	Rent	Imputed rent	Housing services	Housing expenses	Net gain HS - HE
Outright owners	.	X	IR + UC	UC - HB	IR + HB
Owners with mortgage	.	X	IR + UC	(UC + i.M) - HB	(IR - i.M) + HB
Market-rent tenants	X	.	R + UC	(UC + R) - HB	HB
Reduced-rent tenants	X	X	IR + UC	(UC + R) - HB	(IR - R) + HB
Free-rent tenants	.	X	IR + UC	UC	IR

Notes: IR = imputed rent, R = rent, UC = usage costs, i.M = mortgage interest repayments, HB = cash housing benefits.
Sources: authors' chart.

- ▶ Housing services = what the households **should** pay absent housing policies
- ▶ Housing expenses = what the households **really** pay
- ▶ Net gain = proxy for the cash advantages of the different tenure status choices

Methodology
Net gain by tenure status - Econometric model

$$\frac{\text{Net gain}_i}{\text{Net gain}_0} = \beta_0 + \sum_{k=1}^{4} \beta_k \times \mathbb{1}\{\text{Tenure status}\}_{ik} + X'\beta_2 + \epsilon_i \quad (1)$$

▶ Regression using weighted least squares for each country separately

▶ Net gain$_i$ is the cash net gain of household i normalized by the average net gain of country c (Net gain$_0$)

▶ Tenure status$_{ik}$ is a categorical variable defining the tenure status k of the household i

▶ X is a vector of household and dwelling characteristics

Reduction in inequality

Figure 1: Gini of baseline income compared to income including housing benefits
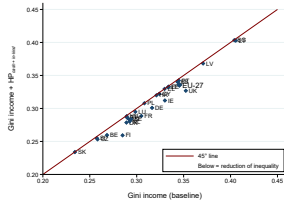
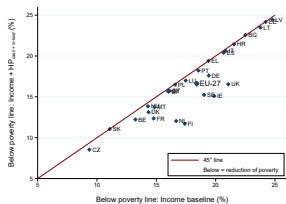(a) Gini income + HP$_{cash+in\text{-}kind}$
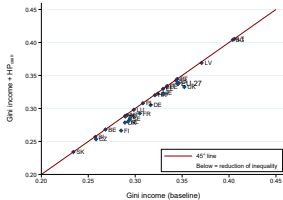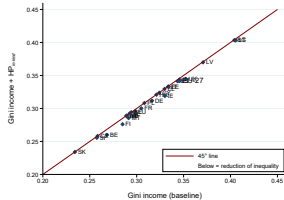
(b) Gini income + HP$_{cash}$

(c) Gini income + HP$_{in\text{-}kind}$

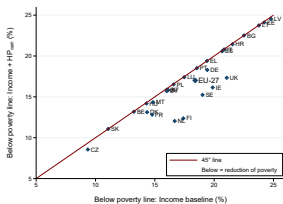*Notes:* income represents disposable income/CU/month without housing benefits.
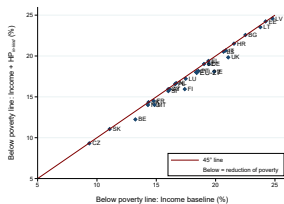*Sources:* EU-SILC 2017; authors' graphs.

Reduction in poverty

Figure 2: Poverty rate (FGT_0) with baseline income compared to income including housing benefits

(a) Below poverty line: income + $HP_{cash+in-kind}$ (b) Below poverty line: income + HP_{cash} (c) Below poverty line: income + $HP_{in-kind}$

Notes: poverty rate represents the share of households below the poverty line. Poverty line = 60% of median income. We estimate four different poverty lines, one for each income measure with and without housing benefits. Income represents disposable income/CU/month without housing benefits.
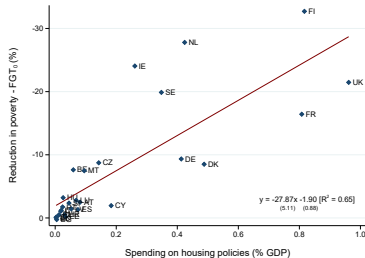*Sources:* EU-SILC 2017; authors' graphs.

Reduction according to the public spending

Figure 3: Percentage of reduction in inequality and poverty according to the spending under housing policies in % of GDP
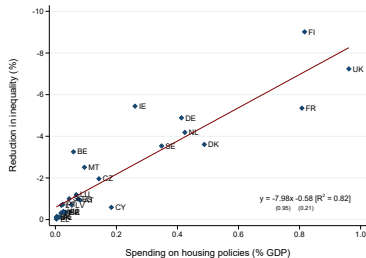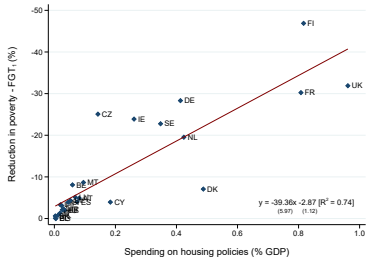

(a) Inequality

(b) Poverty (FGT_0)

Notes: poverty line = 60% of median income. Income represents disposable income/CU/month without housing benefits. Regression line represents the linear relationship between the variable represented on the y-axis and the variable represented in the x-axis. Associated equation displays estimated coefficients and their standards errors (in parentheses).
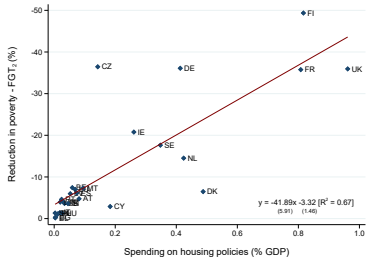*Sources:* EU-SILC 2017; authors' graphs.

Reduction in poverty - FGT_1 and FGT_2

Figure 4: Percentage of reduction in poverty (FGT_1 and FGT_2) according to the spending under housing policies in % of GDP


(a) FGT_1

(b) FGT_2

Notes: reduction represents the reduction after including both housing policies (Income + HP$_{cash+in-kind}$). Poverty line = 60% of median income. Income represents disposable income/CU/month without housing benefits. Regression line represents the linear relationship between the variable represented on the y-axis and the variable represented in the x-axis. Associated equation displays estimated coefficients and their standards errors (in parentheses).
Sources: EU-SILC 2017; authors' graphs.

Reduction according to the public spending

Figure 5: Percentage of reduction in inequality and poverty according to the spending under housing policies in % of GDP
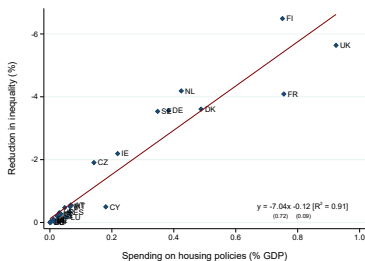
(a) Inequality - Cash housing benefits

(b) Inequality - In-kind housing benefits

Notes: poverty line = 60% of median income. Income represents disposable income/CU/month without housing benefits. Regression line represents the linear relationship between the variable represented on the y-axis and the variable represented in the x-axis. Associated equation displays estimated coefficients and their standards errors (in parentheses).
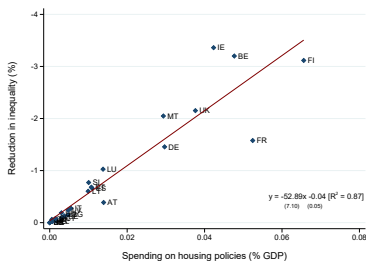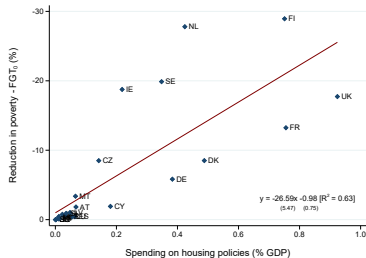*Sources:* EU-SILC 2017; authors' graphs.

Reduction according to the public spending

Figure 6: Percentage of reduction in inequality and poverty according to the spending under housing policies in % of GDP

(a) Poverty (FGT_0) - Cash housing benefits

(b) Poverty (FGT_0) - In-kind housing benefits

Notes: poverty line = 60% of median income. Income represents disposable income/CU/month without housing benefits. Regression line represents the linear relationship between the variable represented on the y-axis and the variable represented in the x-axis. Associated equation displays estimated coefficients and their standards errors (in parentheses).
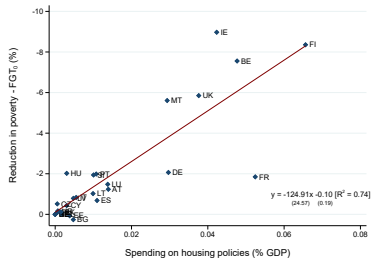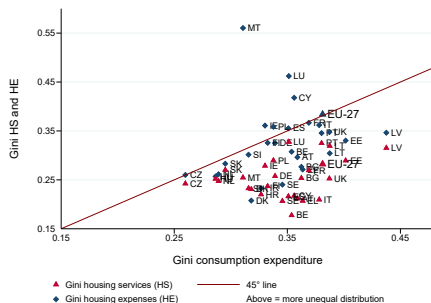*Sources:* EU-SILC 2017; authors' graphs.

Gini of consumption expenditure compared to Gini of housing services (HS) and expenses (HE)

Figure 7: Gini of consumption expenditure compared to Gini of housing services (HS) and expenses (HE)


Notes: consumption expenditure corresponds to households' total consumption expenditure/CU/month excluding rent and housing costs. Housing expenses corresponds to housing expenditures/CU/month including housing policies (cash + in-kind benefits).
Sources: HBS 2015, EU-SILC 2017; authors' graph.

Advantages by tenure status: Net gain

Figure 8: Regression estimates: Net Gain by tenure status
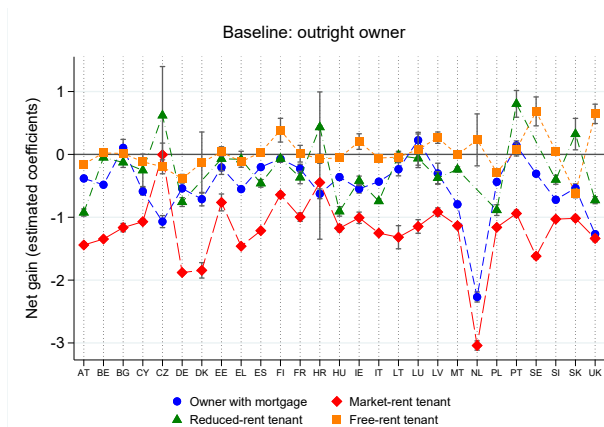
Baseline: outright owner

Notes: estimates of equation 1 using weighted least squares with robust standard errors and 95% confidence intervals (CIs). CIs that are not visible are behind the symbols.
Sources: EU-SILC 2017; authors' graph.

Capture of the cash housing benefits

▶ Previous literature has highlighted the fact that landlords can capture a sizable share of cash housing benefits by raising rents: pass-through rate [20 ; 80]

▶ Prevent the housing policy from being fully efficient in reducing inequality and poverty

▶ To test the possible impact on our estimates, we simulate a counterfactual situation, taking into account this possible partial capture and pass-through in rents

  ▶ We apply a mean capture rate of 50% to our simulations for all countries

Capture of the cash housing benefits

1. We cut by half the actual amount of the subsidy for market-rent tenants receiving cash housing benefits

2. We now assume that the rent reflects the inflating effect of the capture by landlord, then we subtract from the value of the rent of market-rent household j benefiting from the subsidy, the capture rate times the benefit
   - ▶ $\text{Rent}_j - \text{Cash housing benefits}_j \times 0.5$

3. We apply to rental incomes of landlords and imputed rents a correction: $R_i(1 - \eta_c)$
   - ▶ with R_i the imputed rent or rental income of household i
   - ▶ $\eta_c = 0.5 \times \frac{\sum_{j=1}^{S} \text{Cash housing benefits}_j}{\sum_{k=1}^{N} \text{Rent}_k}$ the average pass-through rate for country c
   - ▶ with S the number of beneficiaries of cash housing benefits among market-rent tenants, and N the number of market-rent tenants

Capture of the cash housing benefits

- Simulations' results with a capture of 50% by landlords show a slight increase in inequality and poverty
  - especially for the Northern and Western European countries

- Ranking is maintained and reducing effects are smaller overall, compared to the main results

- Disentangling the effect of the housing policies confirmed our major finding
  - even with a half capture of the cash housing benefits by landlord, they remain more effective than in-kind housing benefits at reducing households' inequality and poverty

- Results on consumption expenditure compared to housing services and expenses, and net gain estimates show almost no differences compared to the main results overall

▸ Graphs

To sum up - Findings

- ▶ Cash housing benefits are more cost-effective than in-kind housing benefits (social housing), and more effective in reducing poverty than inequality

- ▶ Some countries, like Finland, Germany, France, Ireland, or Sweden achieved better or similar results on reducing inequality and poverty while spending much less than the UK

- ▶ Inequality in housing expenses is comparable to that in consumption expenditure (excluding housing costs), which is, in turn, much higher than inequality in housing services
    - ▶ i.e., inequalities in housing conditions are much less salient than inequalities in consumption of other goods and services

- ▶ Most advantageous tenure status is outright ownership
    - ▶ after including cash and in-kind housing benefits (without taking into account lifetime spending)

Conclusion

- ▶ Previous studies have shown the leaky bucket effect of cash housing benefits' expenditures
  - ▶ partial capture of the subsidies by landlords (i.e., increase in rents)
- ▶ Nonetheless, our simulations performed by applying a partial capture of the cash housing benefits by landlords (50 %), confirmed our main findings

- ▶ Finally, their effectiveness in reducing poverty and inequality must be taken into account, and compared to the lower efficiency of social housing
  - ▶ which has been proved in international studies to promote social/urban segregation and to limit tenants' mobility

Appendix

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Related literature

- The economic literature on housing inequality primarily addresses housing wealth inequality...
  - Inequalities declined in the mid 20th century in the US, before to rise again (U-shape); driven mostly by changes in the relative value of locations (Albouy and Zabek 2016)
  - Decreased in Germany over the past century (Albers et al. 2022)
  - Higher income inequality increases the likelihood of affordability problems for low-income renters and leads to crowding issues (Dewilde and Lancee 2013)
- ... and focused mostly on the inclusion of the imputed rents into the disposable income
  - which reduces standard of living inequality because imputed rents are more equally distributed than monetary income
  - Lerman and Lerman (1986); Smeeding (1993); Frick and Grabka (2003), Frick et al. (2007; 2010); Fessler et al. (2016); Dustmann et al. (2022); Maestri (2012; 2013a;b; 2015)

Stylized facts

Figure 9: Distribution of tenure status
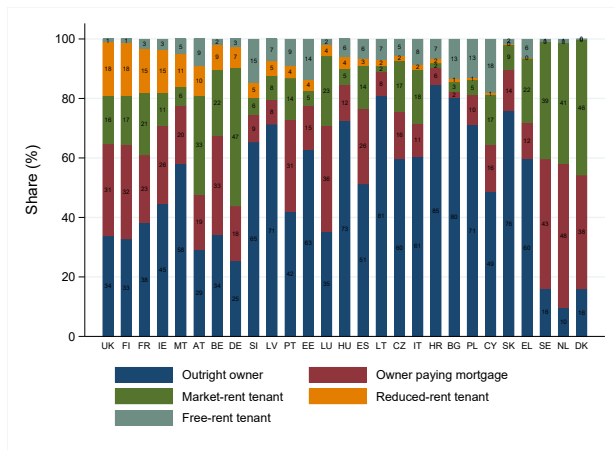
Notes: countries are sorted from high to low share of reduced-rent tenants.
Sources: EU-SILC 2017; authors' graph.

Stylized facts

Figure 10: Share of owners
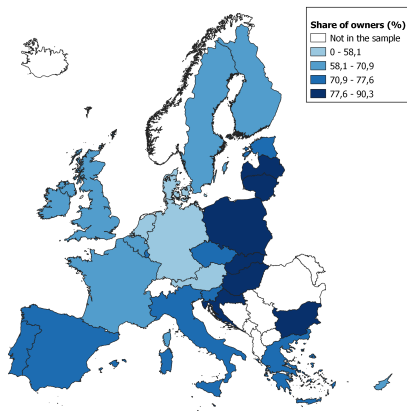
Notes: share of owners among total households. Owners = outright owners + owners with mortgage.
Sources: EU-SILC 2017; authors' drawing.

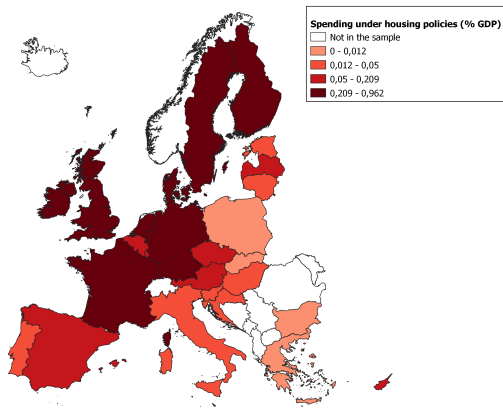# Stylized facts

Figure 11: Share of reduced-rent tenants
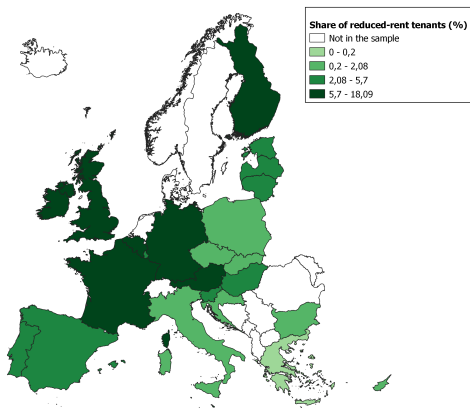
Notes: share of reduced-rent tenants among total households.
Sources: EU-SILC 2017; authors' drawing.

Stylized facts

Figure 12: Spending under housing policies in % of GDP

Sources: EU-SILC 2017; authors' drawing.

Stylized facts

Figure 13: Share of households receiving housing support among total population

(a) Share of households receiving one or both housing benefits among total population

(b) Share of households receiving cash housing benefits among total population

(c) Share of households receiving in-kind housing benefits among total population
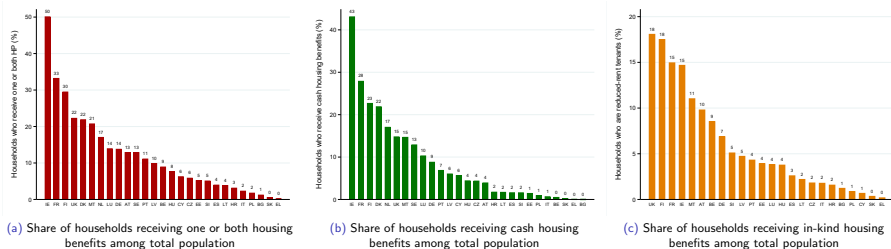
Notes: Housing Policies = cash or in-kind housing benefits. Countries are sorted from high to low percentage.
Sources: EU-SILC 2017; authors' graphs.

Stylized facts

Figure 14: Mean gain from HP in proportion of income (%)
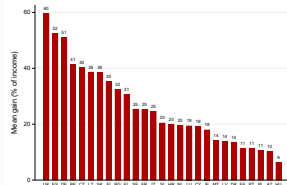
(a) Mean gain from both housing policies
($HP_{cash+in-kind}$)
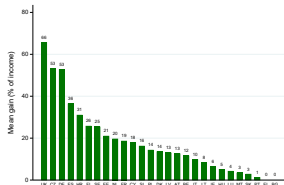
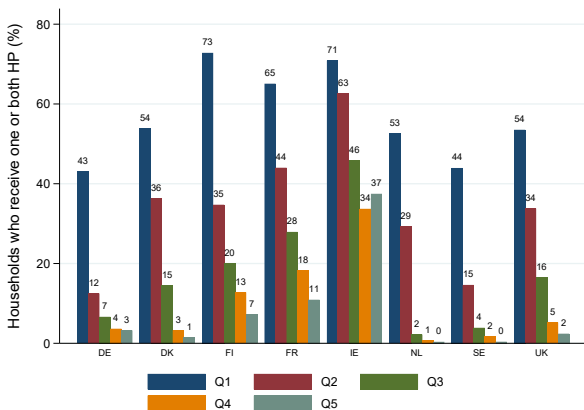(b) Mean gain from cash housing benefits (HP_{cash})
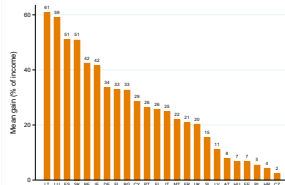
(c) Mean gain from in-kind housing benefits
($HP_{in-kind}$)

Notes: countries are sorted from high to low gain from housing policies. Income = disposable income/CU/month (without housing benefits) in euro PPP EU-28. Mean gain corresponds to the cash advantage from housing policies (see, Table 1).
Sources: EU-SILC 2017; authors' graphs.

Figure 15: Share of households receiving housing support among total population, per equivalized quintile of disposable income for selected countries
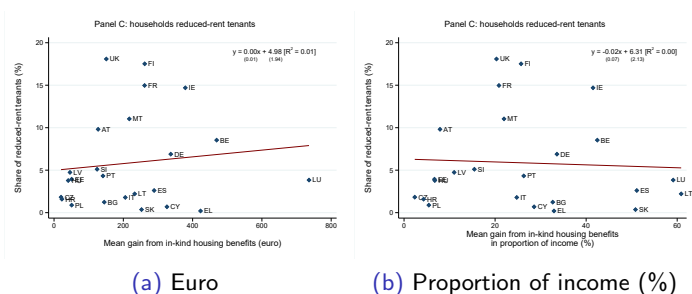
Stylized facts

Figure 16: Share of reduced-rent tenants according to the mean gain from in-kind housing benefits


(a) Euro   (b) Proportion of income (%)

Notes: income represents disposable income/CU/month without housing benefits. Regression line represents the linear relationship between the variable represented on the y-axis and the variable represented in the x-axis. Associated equation displays estimated coefficients and their standards errors (in parentheses).
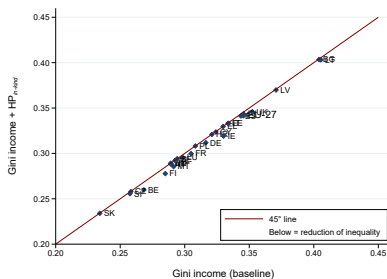*Sources:* EU-SILC 2017; authors' graph.

Capture of the cash housing benefits

Figure 17: Gini of baseline income compared to income including housing benefits, with partial capture of cash housing benefits by landlords
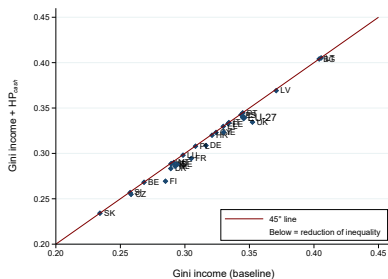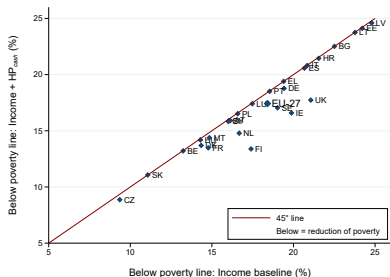

(a) Gini income + HP_{cash}

(b) Gini income + $HP_{in-kind}$

Notes: income represents disposable income/CU/month without housing benefits. Partial capture rate of the cash housing benefits by landlords of 50%.
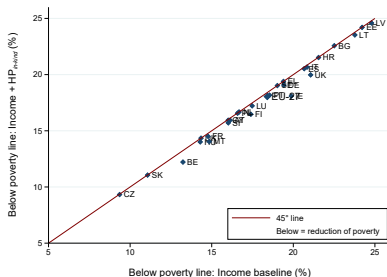*Sources:* EU-SILC 2017; authors' graphs.

Capture of the cash housing benefits

Figure 18: Poverty rate (FGT_0) with baseline income compared to income including housing benefits, with partial capture of cash housing benefits by landlords
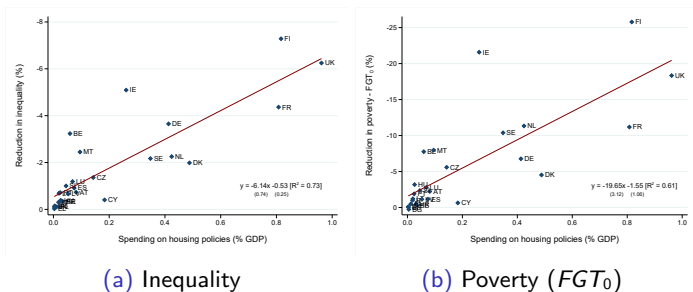

(a) Below poverty line: income + HP_{cash}

(b) Below poverty line: income + $HP_{in-kind}$

Notes: poverty rate represents the share of households below the poverty line. Poverty line = 60% of median income. We estimate four different poverty lines, one for each income measure with and without housing benefits. Income represents disposable income/CU/month without housing benefits. Partial capture rate of the cash housing benefits by landlords of 50%.
Sources: EU-SILC 2017; authors' graphs.

Capture of the cash housing benefits

Figure 19: Percentage of reduction in inequality and poverty according to the spending under housing policies in % of GDP, with partial capture of cash housing benefits by landlords
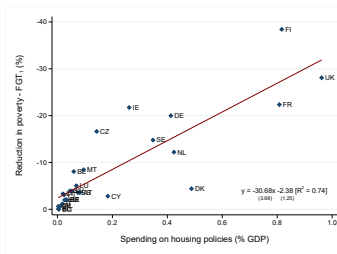

(a) Inequality

(b) Poverty (FGT_0)

Notes: reduction represents the reduction after including both housing policies (Income + HP$_{cash+in-kind}$). Poverty line = 60% of median income. Income represents disposable income/CU/month without housing benefits. Regression line represents the linear relationship between the variable represented on the y-axis and the variable represented in the x-axis. Associated equation displays estimated coefficients and their standards errors (in parentheses). Partial capture rate of the cash housing benefits by landlords of 50%.
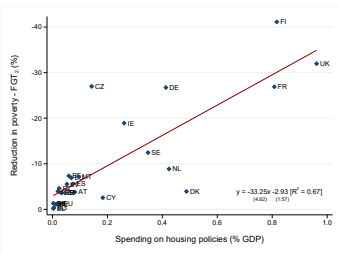*Sources:* EU-SILC 2017; authors' graph.

Capture of the cash housing benefits

Figure 20: Percentage of reduction in poverty (FGT_1 and FGT_2) according to the spending under housing policies in % of GDP, with partial capture of cash housing benefits by landlords


(a) FGT_1 (b) FGT_2

Notes: reduction represents the reduction after including both housing policies (Income + $HP_{cash+in-kind}$). Poverty line = 60% of median income. Income represents disposable income/CU/month without housing benefits. Regression line represents the linear relationship between the variable represented on the y-axis and the variable represented in the x-axis. Associated equation displays estimated coefficients and their standards errors (in parentheses). Partial capture rate of the cash housing benefits by landlords of 50%.
Sources: EU-SILC 2017; authors' graph.

Capture of the cash housing benefits

Figure 21: Gini of consumption expenditure compared to Gini of housing services (HS) and expenses (HE), with partial capture of cash housing benefits by landlords

Notes: consumption expenditure corresponds to households' total consumption expenditure/CU/month excluding rent and housing costs. Housing expenses corresponds to housing expenditures/CU/month including housing policies (cash + in-kind benefits). Partial capture rate of the cash housing benefits by landlords of 50%.
Sources: HBS 2015 and EU-SILC 2017; authors' graphs.

Capture of the cash housing benefits

Figure 22: Regression estimates: Net Gain by tenure status, with partial capture of cash housing benefits by landlords
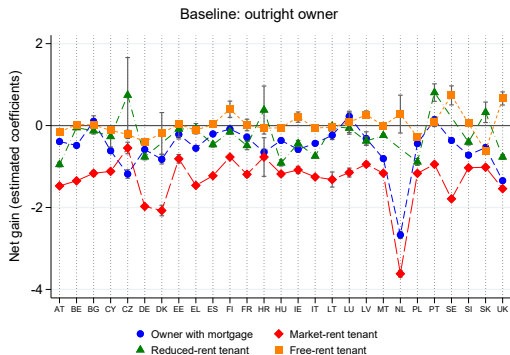
Baseline: outright owner

Notes: estimates of equation 1 using weighted least squares with robust standard errors and 95% confidence intervals (CIs). CIs that are not visible are behind the symbols. Partial capture rate of the cash housing benefits by landlords of 50%.
Sources: EU-SILC 2017; authors' graphs.

◂ Return

Robustness check for imputed rents

▶ Main concern that could be raised by our study, is the reliability of the estimates using different imputed rents from each country

▶ We compute our own imputed rents for the owners, free-rent and reduced-rent tenants
  ▶ We reproduce the method developed in Verbist and Grabka (2017)
  ▶ Regression approach (with Heckman correction) with an additional error correction term in order to maintain the distribution of the rents

1. We applied a Heckman procedure on the population of tenants (market-rent + reduced-rent), by regressing the logarithm of the actual rent of the market-rent tenants on covariates of the characteristics and location of the dwelling, amenities, and household's characteristics
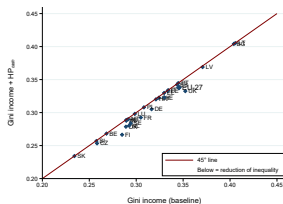
Robustness check for imputed rents

2. We use the estimated coefficients to predict the rents value (imputed rents) for owners, reduced-rent and free-rent tenants

3. We add an error correction term to the predicted rents. This *ad hoc* error component is randomly chosen from a normal distribution with a zero mean and a variance equal to the difference between the standard deviation of the actual rent variable and the standard deviation of the predicted rent variable for market-rent tenants

▶ Estimates show that most of the countries' rankings and estimates' magnitudes are maintained
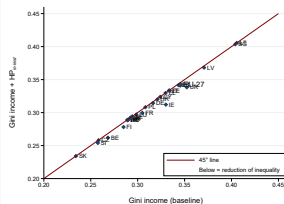
Robustness check for imputed rents

Figure 23: Gini of baseline income compared to income including housing benefits, using regression (Heckman) approach for imputed rents
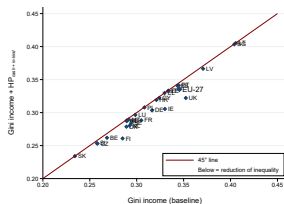
(a) Gini income + HP$_{cash+in-kind}$
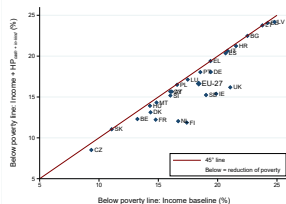
(b) Gini income + HP$_{cash}$

(c) Gini income + HP$_{in-kind}$

Notes: income represents disposable income/CU/month without housing benefits.
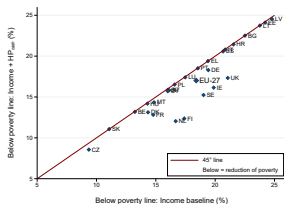*Sources:* EU-SILC 2017; authors' graphs.

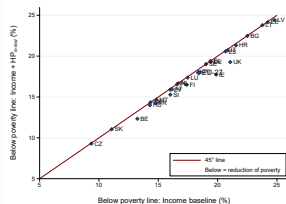# Robustness check for imputed rents

Figure 24: Poverty rate (FGT_0) with baseline income compared to income including housing benefits, using regression (Heckman) approach for imputed rents

(a) Below poverty line: income + HP$_{cash+in\text{-}kind}$

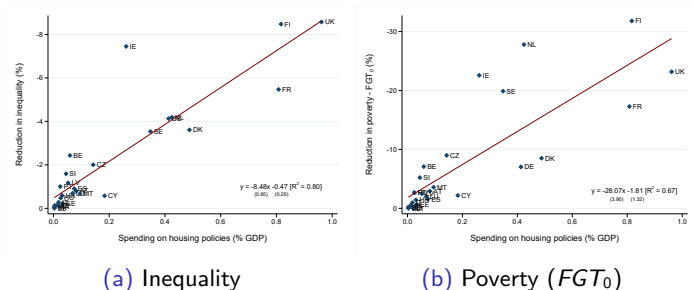(b) Below poverty line: income + HP$_{cash}$

(c) Below poverty line: income + HP$_{in\text{-}kind}$

Notes: poverty rate represents the share of households below the poverty line. Poverty line = 60% of median income. We estimate four different poverty lines, one for each income measure with and without housing benefits. Income represents disposable income/CU/month without housing benefits.
Sources: EU-SILC 2017; authors' graphs.
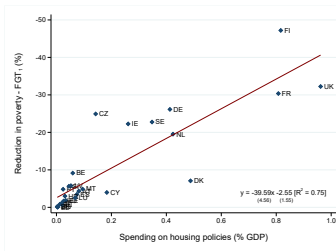
Robustness check for imputed rents

Figure 25: Percentage of reduction in inequality and poverty according to the spending under housing policies in % of GDP, using regression (Heckman) approach for imputed rents
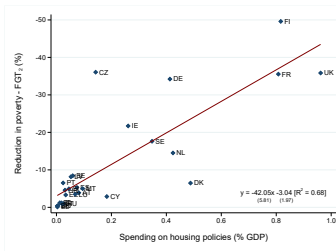

(a) Inequality

(b) Poverty (FGT_0)

Notes: reduction represents the reduction after including both housing policies (Income + $HP_{cash+in-kind}$). Poverty line = 60% of median income. Income represents disposable income/CU/month without housing benefits. Regression line represents the linear relationship between the variable represented on the y-axis and the variable represented in the x-axis. Associated equation displays estimated coefficients and their standards errors (in parentheses).
Sources: EU-SILC 2017; authors' graphs.

Robustness check for imputed rents

Figure 26: Percentage of reduction in poverty (FGT_1 and FGT_2) according to the spending under housing policies in % of GDP, using regression (Heckman) approach for imputed rents


(a) FGT_1 (b) FGT_2

Notes: reduction represents the reduction after including both housing policies (Income + $HP_{cash+in-kind}$). Poverty line = 60% of median income. Income represents disposable income/CU/month without housing benefits. Regression line represents the linear relationship between the variable represented on the y-axis and the variable represented in the x-axis. Associated equation displays estimated coefficients and their standards errors (in parentheses).
Sources: EU-SILC 2017; authors' graphs.

Robustness check for imputed rents

Figure 27: Gini of consumption expenditure compared to Gini of housing services (HS) and expenses (HE), using regression (Heckman) approach for imputed rents
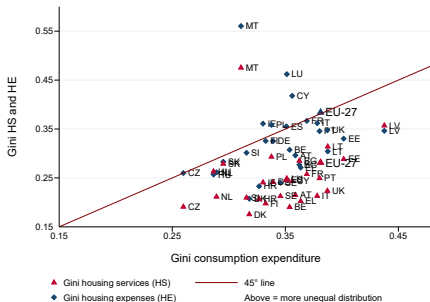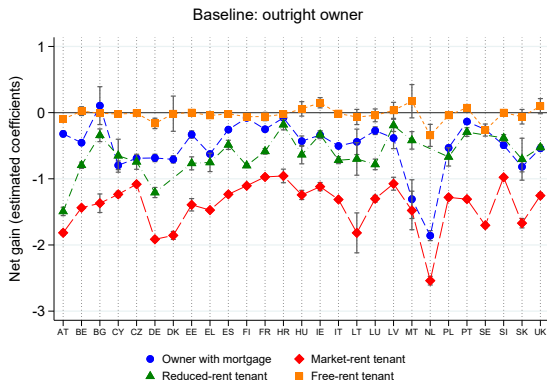

Notes: consumption expenditure corresponds to households' total consumption expenditure/CU/month excluding rent and housing costs. Housing expenses corresponds to housing expenditures/CU/month including housing policies (cash + in-kind benefits).
Sources: HBS 2015, EU-SILC 2017; authors' graph.

Robustness check for imputed rents

Figure 28: Regression estimates: Net Gain by tenure status, using regression (Heckman) approach for imputed rents

Baseline: outright owner

Legend:
- Owner with mortgage (blue circle)
- Market-rent tenant (red diamond)
- Reduced-rent tenant (green triangle)
- Free-rent tenant (orange square)

Notes: estimates of equation 1 using weighted least squares with robust standard errors and 95% confidence intervals (CI). CI that are not visible are behind the symbols.
Sources: EU-SILC 2017; authors' graph.